PATENT SPECIFICATION

451,389

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Complete Specification Accepted : Aug. 5, 1936.

COMPLETE SPECIFICATION

Wall Board and Method of Manufacturing the Same

I, WILLIAM WARREN TRIGGS, of the firm of Marks & Clerk, 57 & 58, Lincoln's Inn Fields, London, W.C.2, a British subject, do hereby declare the nature of this invention (a communication to me from abroad by Georgia M. Walper, a subject of the King of Great Britain, of Mountain View Apartments, South James Street, Hamilton, Ontario, Canada), and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to wall board, plaster board, plaster lath and the like, and refers more particularly to an improved method of manufacturing the same.

One of the principal objects of the invention is to provide a board of the character set forth with edge zones of reduced thickness whereby shallow valleys are provided at the abutting edges of adjacent boards to receive coatings of plaster and the like for covering the joint between adjacent boards.

The present invention also contemplates a relatively simple and inexpensive method of producing plaster boards having the aforesaid reduced edge zones, with a relatively simple and inexpensive apparatus.

The several objects, advantages, and novel details of construction of my improved board, together with the several steps of the method of producing the board will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings.

The present invention consists in a method of forming wall boards, plaster boards and the like having face sheets, which comprises forming a series of outwardly extending projections in one of the face sheets to produce a zone in which the completed board is of less thickness than the remainder thereof and with the face sheet at the said zone arranged inwardly out of the plane of the major portion of the face sheet.

The present invention also consists in a wall board, plaster board and the like made by the method according to the preceding paragraph.

Referring to the drawings:

Figure 1 is a longitudinal sectional elevational view showing semi-diagrammatically one form of apparatus that may be employed in carrying out my improved method;

Figure 2 is a top plan view of the apparatus shown in Figure 1;

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 7;

Figures 4 and 5 are respectively cross sectional views taken substantially on the planes indicated by the lines 4—4 and 5—5 of Figure 2;

Figure 6 is a detailed sectional view through the abutting edges of the pair of adjacent boards;

Figure 7 is an enlarged fragmentary plan view partly in section of a portion of the apparatus shown in Figure 2.

Figure 8 is a plan view of a portion of the board formed by the apparatus.

Heretofore in this art it has been the practice to produce wall boards, plaster boards, plaster lath and like articles with the longitudinal edges somewhat reduced in thickness so that at the abutting longitudinal edges of adjacent boards shallow valleys would be provided to receive a thin layer of plaster or other material for covering the joint. However, no provision has been made for finishing the joint between the other abutting edges of adjacent boards, and in accordance with my invention I provide means whereby these other edges may be reduced in thickness, so that the joints at all edges of the board may be correspondingly finished.

As shown in Figure 6, the reference character 10 indicates the abutting edges of two adjacent boards A and B, these abutting edges being of less thickness than the remainder of the board to provide a shallow valley at the joint 11 which may be covered with a thin layer 12 of plaster or other filling material so that the joint may be concealed and finished.

In the construction of wall boards, plaster boards, plaster lath and the like, a layer of plaster or other cementitious material 15 is interposed between the top

[Price]

and bottom face sheets 13 and 14 respectively of the board. In accordance with my invention, I propose forming a rectilinear series of outwardly extending projections in the outer or top face sheet 13, these projections being formed transversely of the face sheet, or longitudinally of the face sheet at the edges thereof, or both transversely and longitudinally. The purpose of the outwardly extending projections is to act, during the formation of the board, to hold the portions of the outer surface of the face sheet on opposite sides of the projections spaced from the supporting table upon which the board is produced and thereby provide zones in which the completed board is of less thickness than the remainder thereof. As will be more fully hereinafter set forth, a rectilinear series of projections 16 is formed in the board at points spaced a predetermined distance from each other longitudinally of the board, and the board is ultimately severed on a line extending through the projections so that when the sections of the board are reassembled, as in Figure 6, a valley is formed opposite the joint 11, of sufficient depth to permit the plaster filler 12 to conceal the projections and at the same time provide a surface flush with the outer face of the board.

As shown in Figures 1 and 2, the outer or top face sheet 13 is unwound from a roll 13^1 and is continuously advanced through the apparatus by means of suitable feed rolls (not shown herein). The inner or bottom face sheet 14 is unwound from a roll 14^1 and is placed onto the plastic filler 17, which in turn is distributed on the inner surface of the face sheet 13 from a supply spout 18. Prior to distributing the plastic filler upon the inner surface of the face sheet 13, a rectilinear series of transversely extending projections 16 are pressed outwardly from the sheet, by means of forming rolls 19 located upon opposite sides of the path of travel of the face sheet 13 and periodically operated to form a rectilinear series of transversely extending projections on the face sheet at points spaced a predetermined distance from each other in the direction of travel of the sheet. In the present instance, the upper forming roll 20 is provided with a rectilinear series of projections 21 corresponding in number and spacing to the projections 16, while the lower roll 22 is provided with a rectilinear series of recesses 23 in the periphery thereof adapted to register with the projections 21. It will, of course, be understood that both rolls when operated are positively driven at the same peripheral speed and also that this speed corresponds to the rate of travel of the face sheet 13. The manner in which the rolls are periodically operated to form the projections 16 will be more fully hereinafter described.

After the face sheet 13 passes between the forming rolls 19 the same is caused to pass between two additional pairs of forming rolls 24 adapted to form outwardly extending projections 25 at the opposite longitudinal marginal edges of the face sheet 13. The projections 25 are similar to the projections 16 and serve to hold the longitudinal edges of the face sheet spaced from the supporting table 26 so as to provide for reducing the thickness of the longitudinal edges of the face sheet, as well as the transverse edges thereof. The forming rolls 24 are continuously rotated by engagement with the face sheet 13 and, in the present instance, the top rolls of each pair are formed with circumferentially spaced outwardly extending projections adapted to deform the marginal edges of the face sheet into corresponding recesses formed in the bottom forming rolls.

After the face sheet 13 passes from between the forming rolls 24, the same is supported upon the table 26 and the plastic filler 17 is distributed on the inner surface of the face sheet by the spout 18. As will be observed from Figure 2, the width of the table 26 is less than the corresponding width of the face sheet 13, and a pair of folding dies 27 is disposed upon opposite sides of the table for folding the longitudinal marginal edges of the face sheet substantially at right angles to the main portion of the face sheet.

Immediately after this folding operation the bottom face sheet 14 is placed onto the filler 17 and both of these sheets are pressed against the filler by a pair of rolls 30 disposed upon opposite sides of the path of travel of the sheets. The rolls 30 perform the additional function of uniformly distributing the filler 17 within the space between the two sheets.

A further pair of folding dies 67 then engage the previously folded edges and fold a portion thereof over onto the bottom face sheet in the manner shown more clearly in Figure 3 to form the side walls 28 of the board.

As the board is advanced from between the rolls 30, the same is supported by a travelling table 31, and is subsequently cut into lengths determined by the distance between the projections 16. In the present instance, a pair of travelling cutters 32 is disposed upon opposite sides of the path of travel of the board and are operated in any suitable manner in timed

relation to the rate of travel of the board to cut the same along the line of the projections 16. In other words, each time a rectilinear series of the projections 16 passes between the cutters, the latter are not only moved in the direction of the path of travel of the board at the same speed as the latter, but, are simultaneously moved toward each other to sever the board along a line extending through the projections 16.

The mechanism for effecting the desired movements of the severing device 32 is not shown in detail herein, but, nevertheless, this mechanism is preferably operated by an electric motor 33 arranged in a circuit controlled by a double coil relay having a primary coil 51 and a secondary coil 52. As shown in Figure 2, the primary coil 51 is located in a circuit controlled by a switch 34, diagrammatically shown as having a contact arm 35 pivoted intermediate the ends thereof as at 36, and as having a contact 37 at one end normally urged into engagement with a stationary contact 38, by means of a spring 39 acting on the opposite end of the arm (see Figure 7). However, the spring 39 is prevented from moving the contact 37 into engagement with the contact 38, by means of a projection 40 located at the spring end of the arm and held into frictional engagement with the adjacent side wall of the board by the spring 39. The arrangement is such as to normally maintain the switch 34 open, and, since this switch controls the circuit to the primary coil 51, which in turn controls the motor circuit, it necessarily follows that the latter will also be normally maintained open.

In order to provide for closing the motor circuit by the relay to effect an operation of the severing device, a series of recesses 41 is formed in the side wall of the board adjacent the switch 34 at points spaced from each other a distance equal to the spacing between the transverse projections 16. It will, of course, be understood that the switch 34 is so located that the projection 40 on the bar 35 registers with the recesses 41 so as to permit the necessary pivotal movement of the bar 35 required to close the primary circuit to the coil 51 by engaging the contact 37 with the contact 38. The coil 51 is energised by closing the primary circuit and energization of the coil operates the relay to close the motor circuit. Inasmuch as advancement of the board is continuous during the forming operation, or, in other words, is not interrupted as the severing mechanism operates to cut the board, it necessarily follows that the switch 34 will be opened immediately after the same is closed, and to avoid breaking the circuit to the motor for actuating the severing device until the latter has completed its operation, the secondary coil 52 is located in a circuit normally energized with a current of insufficient strength to actuate the relay to close the circuit to the motor 33, but, possessing sufficient strength to maintain the relay closed after the switch 34 is opened. Of course, it will be apparent that the circuit to the secondary coil 52 is also provided with a switch 53 adapted to be automatically opened by suitable mechanism upon completion of the operation of the severing device for example when the cutters meet so as to permit the relay to open the circuit to the motor 33.

The recesses 41 for operating the switch 34 in the manner previously set forth, are formed in the marginal edge portions of the face sheet prior to folding the latter edge portions to form the side walls of the board by a set of forming rolls 43 identical in construction to the forming rolls 19, with the exception that only one projection 45 is formed on the lower roll, and a single recess 44 is formed in the periphery of the upper roll to register with the projection 44. The rolls 43 are driven at exactly the same peripheral speed as the rolls 19, and the space between the two sets of rolls determines the location of the switch 34 with respect to the severing device. In other words, the construction is such that when the projection 40 on the switch bar 35 engages in one of the recesses 41, a rectilinear series of projections 16 is in operative relation with the severing device. For convenience in drawing the rolls 43 have been shown closer to the rolls 19 than the space between the recesses 16 and the associated recess 41.

It has been previously stated that the forming rolls 19 are periodically operated, and since the rolls 43 are driven from the rolls 19, it necessarily follows that the rolls 43 are also periodically operated. In the present instance, the operation of the two sets of rolls is automatically controlled by a relay 60 similar in construction to the relay 50, in that it is provided with a primary coil 61 arranged in an electric circuit closed by a switch 62 positioned a predetermined distance beyond the forming rolls 19 and adapted to be closed by engagement with any one of the projections 16. The distance between the switch and forming rolls 19 controls the length of the completed boards and, accordingly, the switch is mounted for adjustment relative to the rolls 19. In view of the

fact that the projections 16 travel with the face sheet 13, it necessarily follows that the switch 62 will be opened immediately after it is closed and, accordingly, I provide the relay with a secondary coil 64 arranged in a circuit closed by a switch 65, and the electrical energy supplied to this circuit is of sufficient strength to hold the relay in a position wherein the circuit to the motor for driving the rolls 19 is closed after the switch 62 has been opened, but, of insufficient strength to close the relay without the assistance of the electric circuit within which the coil 61 is located. In the present instance, one complete revolution of the two sets of forming rolls 19 and 43 is desired in order to form only one set of projections 16 and 41 at one time, and any suitable mechanism (not shown) associated with the rolls 19 or 43 for example may be provided for automatically opening the switch 65 to permit the relay to open the circuit to the motor 66. In the present instance, the switch 65 is automatically opened when the two sets of forming rolls 19 and 43 assume the positions thereof shown in Figure 1, wherein the projections on the peripheries of the upper rolls 20 and the lower of the rolls 43, are located in such a manner that as soon as the forming rolls are again operated, the projections function immediately to form the projections on the face sheet 13.

While in describing my improved board and the method of making the same particular stress has been placed upon the construction of the apparatus employed, nevertheless, it is to be understood that various different types of apparatus may be utilized for carrying out the steps of the method without departing from the scope of this invention as defined by the appended claims.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A method of forming wall boards, plaster boards and the like having face sheets, which comprises forming a series of outwardly extending projections in one of the face sheets to produce a zone in which the completed board is of less thickness than the remainder thereof and with the face sheet at the said zone arranged inwardly out of the plane of the major portion of the face sheet.

2. The method as claimed in Claim 1, wherein the series of projections is rectilinear and is formed transversely and/or longitudinally of the sheet.

3. The method as claimed in Claim 1 or 2 in which the projections are formed in the face sheet prior to the depositing of an intermediate layer of material thereon.

4. The method as claimed in Claim 1, 2 or 3 comprising continuously advancing a face sheet and periodically forming the series of projections thereon.

5. A method of forming wall boards, plaster boards and the like including face sheets and an intermediate layer of material which consists in continuously advancing a face sheet, periodically producing a rectilinear series of projections on the outer face of said face sheet, advancing said face sheet with its outer face engaging a supporting table whereby said face sheet is held spaced from said supporting table in the zone of said projections, depositing a layer of material on said face sheet and applying a second face sheet on said layer of material.

6. The method as claimed in any of the preceding claims, comprising controlling the operation of projection forming means by the location of the previously formed projections.

7. The method as claimed in any of the preceding claims, comprising periodically severing the completely formed board at the out of plane zones.

8. The step in the method as claimed in any of the preceding claims, which consists in forming an outwardly extending rectilinear series of projections in one of the face sheets to offset the face sheet inwardly out of the plane of the major portion of the face sheet to reduce the thickness of the completed board in the zone of said projections.

9. The method as claimed in Claim 8, wherein the series of projections is formed adjacent one of the marginal edges of the face sheet whereby the marginal edge portion is offset.

10. A wall board, plaster board and the like made by the method claimed in any of the preceding claims.

11. A wall board, plaster board and the like, having face sheets in which all the marginal edge portions of one of the face sheets are provided with a series of outwardly extending projections and are offset inwardly out of the plane of the major portion of the face of the sheet an amount determined by said projections, whereby the board is reduced in thickness at said marginal edge portions.

12. The method of forming wall boards, plaster boards and the like substantially as described with reference to the accompanying drawings.

Dated this 9th day of September, 1935.

MARKS & CLERK.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1936.

FIG.1.

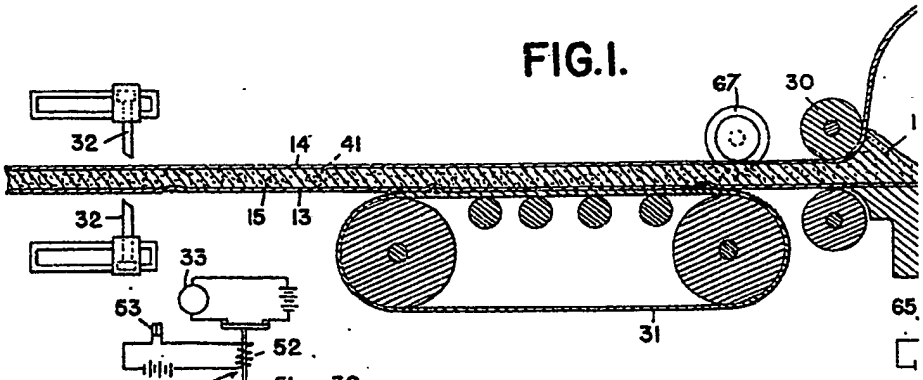


FIG.2

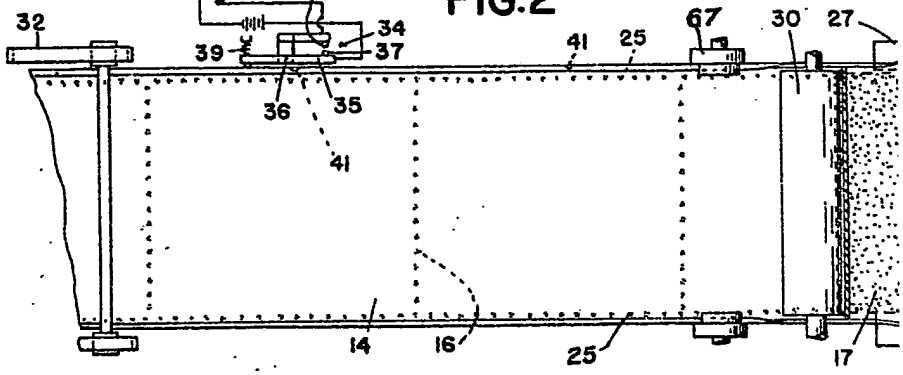


FIG.3.

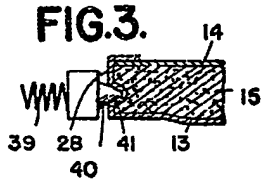
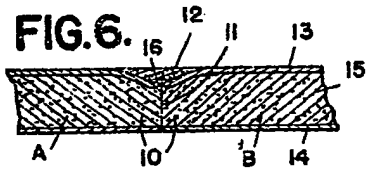


FIG.6.



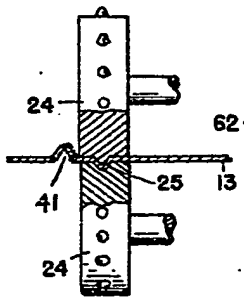


FIG.4.

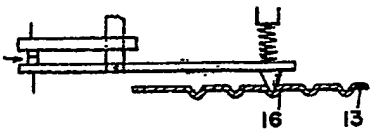
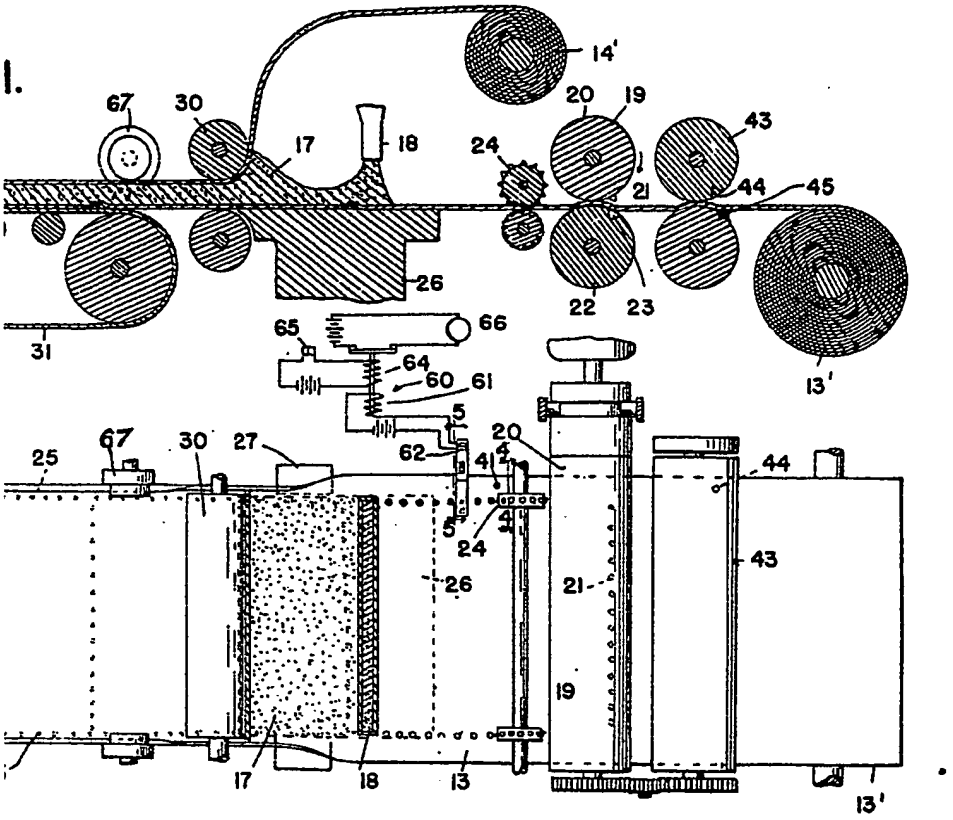
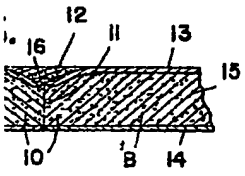


FIG.5.





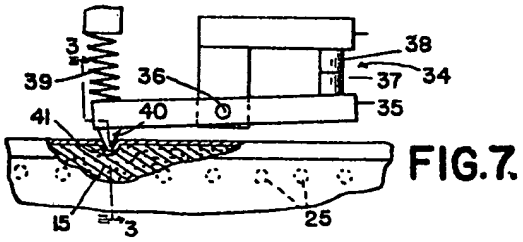


FIG.7.

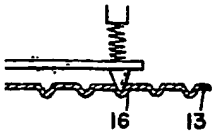


FIG.5.

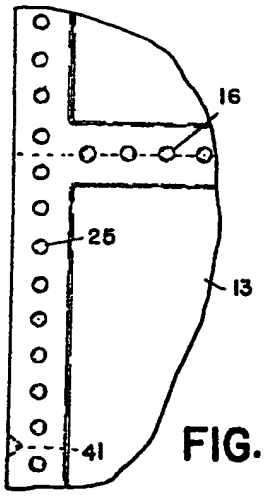


FIG.8.

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FIG.1.

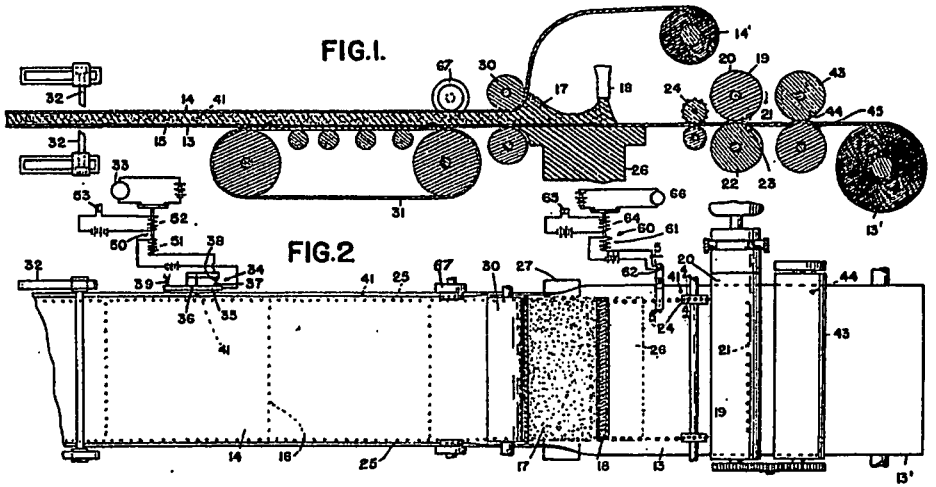


FIG.2.

FIG.3.

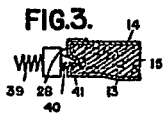
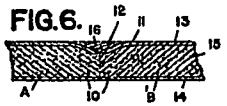


FIG.6.



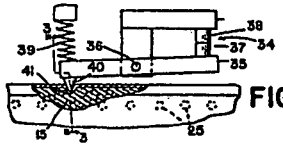


FIG.7.

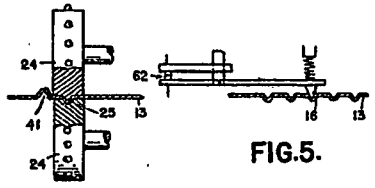


FIG.4.

FIG.5.

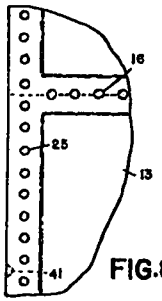


FIG.8.

Malby & Sons, Photo-